

Amendments to the Drawings:

The drawings have been objected to under 37 CFR 1.121(d) because "the shaft 3b and piston 3 appear to reference the same structure". Applicant respectfully submits that piston 3 and shaft 3b are not the same structure, rather, the piston 3 **includes** the shaft portion 3b and the contact portion 3a. As recited in Applicants specification, "**Piston 3 contains** contact part 3a which contacts with first coil spring 1 and second coil spring 2, **and shaft 3b** which is connected to contact part 3a." (Page 7, Lines 17-19). Applicants believe that the foregoing explanation clarifies this issue and no amendment to the drawings is required.

The drawings have also been objected to under 37 CFR 1.83(a) for omission of "the rotatable connection of the travel mechanism and the brake arm" as recited in claim 2. Applicant respectfully submits that the travel mechanism is the piston 3 and the second hook 6 of piston 3 is *rotatably coupled* to the hooking part 9 of the brake arm 24, as illustrated in Figure 1. As recited in Applicants specification, "**Piston 3 operates as a travel mechanism** to expand and contract the first coil spring and the second coil spring in accordance with the travel of brake arm 24" (Page 7, Lines 14-16); "travel mechanism is ... provided with second hook 6. Second hook 6 is hooked on second hooking part 9 attached to brake arm 24" (Page 7, Lines 23-26); and "the travel mechanism and brake arm 24 are **rotatably coupled** with each other" (Page 7, Lines 2-3). Applicants believe that the foregoing explanation clarifies this issue and no amendment to the drawings is required.

Remarks/Arguments:

Claim 1 has been amended to correct a typographical error. No new matter has been added.

Claims 1-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Jun (Japanese Publication No. 253,327) in view of Pluta et al. (U.S. Patent No. 5,563,355) and Seiichi et al. (Japanese Publication No. 247020). It is respectfully submitted, however, that the claims are patentable over the art of record for the reasons set forth below.

Claim 1 recites limitations that are neither disclosed nor suggested by Jun, Pluta, or Seiichi, alone or in combination, namely:

a feeling-of-stepping-force generation mechanism which is **disposed between the stepping force sensor and the brake arm**, and which is **rotatably connected with each of the stepping force sensor and the brake arm** so as to generate a stepping force that changes nonlinearly with respect to a travel stroke of the brake arm, wherein in response to a **tension which is applied via the feeling-of-stepping-force generation mechanism** by a travel of brake arm, the stepping force sensor **detects a stepping force**, thereby generating output to control the brake electrically operated.

With regard to the cited references, Jun discloses a main return spring 17 coupled to the brake pedal 14 that is adapted to return the brake pedal to the waiting position 'A' in a play range 'D' and an operation range 'E'. A sub-return spring 18 that is also coupled to the brake pedal 14 is adapted to return the brake pedal to the waiting position 'A' only in the operation range 'E'. A linear relationship exists between the force applied to the pedal 14 and the displacement of the brake pedal, as illustrated in Figs. 6 and 8. The translation of pedal 14 is converted into an electrical signal by a control part 16 that indirectly communicates with the pedal 14 (refer to the dotted line from part 16 to pedal 14). As indicated by Examiner, Jun lacks a specific disclosure of a stepping force sensor.

Pluta discloses a push rod 105 connected to a brake pedal arm 101 that extends through a fire wall and into a master cylinder 109 of the vehicle's hydraulic brake system. A force sensing device 110 that is mounted to the brake pedal arm 101 engages the push rod

105. The force exerted on the push rod 105 by means of a spring 119 (within device 110) is counteracted by a reaction force applied to the push rod 105 in the master cylinder 109. Pluta does not disclose a "feeling-of-stepping-force generation mechanism", as recited in Applicant's claim 1.

Applicant respectfully submits that the references are not combinable. If Pluta's push rod 105 and force sensing device 110 were to be connected to Jun's brake pedal 14, the combination would render Jun's brake device inoperable for its intended purpose. Applicant cites MPEP § 2143.01, which states "the claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose." Specifically, the force applied by Pluta's push rod 105 would upset the linear tension applied by Jun's springs 17 and 18 and alter the waiting position 'A' and maximum stepping position 'B' of Jun's pedal 14. Similarly, the tension applied by Jun's springs 17 and 18 would upset the balance between the force applied by Pluta's spring 119 and the reaction force applied to the push rod 105 so that the reading of the force sensing device 110 would be erroneous.

Moreover, the combination of the Jun and Pluta references neither discloses nor suggests every element of Applicant's claim 1. Jun's force generation mechanism (i.e. springs 17 and 18) is not **disposed between** Pluta's stepping force sensor (i.e. device 110) and Jun's brake arm 14 in accordance with Applicant's claimed limitation "feeling-of-stepping-force generation mechanism which is disposed between the stepping force sensor and the brake arm". Further, if the references were combined, Pluta's stepping force sensor (i.e. device 110) would gauge the balance of forces between the push rod 105 and the spring 119 *instead of* the tension applied by Jun's springs 17 and 18 (i.e. feeling-of-stepping-force generation mechanism), which is not in accordance with Applicant's claimed limitation "in response to a tension which is applied via the feeling-of-stepping-force generation mechanism by a travel of brake arm, the stepping force sensor detects a stepping force."

The Seiichi et al. reference discloses an arm 21 disposed between and coupled to a brake pedal 15 and a spring mechanism 19. The spring mechanism 19 includes **compressive** coil springs 23, 25 (i.e. feeling-of-stepping-force generation mechanism) which do not apply a tension force to a stepping force sensor or other apparatus. The Seiichi et al. reference, either alone or in combination with the Jun and/or Pluta references, neither discloses nor suggests every element of Applicant's claim 1. It is assumed that Examiner relies on this reference to

merely demonstrate a non-linear relationship between the force F applied to the pedal 15 and the displacement of the brake pedal 15.

Accordingly, because claim 1 includes limitations that are neither disclosed nor suggested by Jun, Pluta et al. and Seiichi et al., alone or in combination, prima facie obviousness cannot be established based on the cited references. Reconsideration of claim 1 is respectfully requested. Claims 2-10 are dependent upon claim 1, and therefore should also be allowed at least as dependent upon an allowable base claim. Reconsideration of claims 1-10 is respectfully requested.

Claims 5-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Jun (Japanese Publication No. 253,327) in view of Pluta et al. (U.S. Patent No. 5,563,355) and Seiichi et al. (Japanese Publication No. 247020) and further in view of Zucchini (U.S. Pat. No. 6,336,626) or Shaw (U.S. Pat. No. 6,367,886). Applicant respectfully submits that neither Zucchini (U.S. Pat. No. 6,336,626) nor Shaw (U.S. Pat. No. 6,367,886) overcome the deficiencies of the Jun, Pluta and Seiichi references used to reject claims 1 and 2, from which claims 5-10 depend. For example, neither Zucchini nor Shaw disclose or suggest a "feeling-of-stepping-force generation mechanism which is disposed between the stepping force sensor and the brake arm, and which is rotatably connected with each of the stepping force sensor and the brake arm", as recited in Applicant's claim 1.

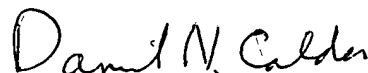
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Conclusion

In view of the remarks set forth above, Applicant respectfully submits that this application is now in condition for allowance, which action is respectfully requested.

Respectfully submitted,



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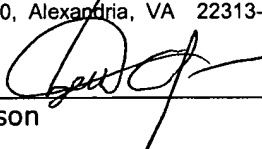
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